PCT/EP2003/007632

Translation

PATENT COOPERATION TREATY

PCT

INTERNATIONAL PRELIMINARY EXAMINATION REPORT

(PCT Article 36 and Rule 70)

Applicant's or agent's file reference P20516WO	FOR FURTHER ACTION	See Notification of Transmittal of International Preliminary Examination Report (Form PCT/IPEA/416)
International application No. PCT/EP2003/007632	International filing date (*day/month/year*) 15 July 2003 (15.07.2003)	Priority date (*day/month/year*) 25 September 2002 (25.09.2002)
International Patent Classification (IPC) or national classification and IPC C25D 5/42		
Applicant ALUMINAL OBERFLÄCHENTECHNIK GMBH & CO. KG		

1. This international preliminary examination report has been prepared by this International Preliminary Examining Authority and is transmitted to the applicant according to Article 36.

2. This REPORT consists of a total of 6 sheets, including this cover sheet.

☐ This report is also accompanied by ANNEXES, i.e., sheets of the description, claims and/or drawings which have been amended and are the basis for this report and/or sheets containing rectifications made before this Authority (see Rule 70.16 and Section 607 of the Administrative Instructions under the PCT).

These annexes consist of a total of _____ sheets.

3. This report contains indications relating to the following items:

- I ☒ Basis of the report
- II ☐ Priority
- III ☐ Non-establishment of opinion with regard to novelty, inventive step and industrial applicability
- IV ☐ Lack of unity of invention
- V ☒ Reasoned statement under Article 35(2) with regard to novelty, inventive step or industrial applicability; citations and explanations supporting such statement
- VI ☐ Certain documents cited
- VII ☐ Certain defects in the international application
- VIII ☐ Certain observations on the international application

Date of submission of the demand	Date of completion of this report
16 March 2004 (16.03.2004)	18 February 2005 (18.02.2005)
Name and mailing address of the IPEA/EP Facsimile No.	Authorized officer Telephone No.

INTERNATIONAL PRELIMINARY EXAMINATION REPORT

International application No.
PCT/EP2003/007632

I. Basis of the report

1. With regard to the **elements** of the international application:*

☐ the international application as originally filed

☒ the description:

pages 1-9, as originally filed
pages _____, filed with the demand
pages _____, filed with the letter of _____

☒ the claims:

pages 1-12, as originally filed
pages _____, as amended (together with any statement under Article 19
pages _____, filed with the demand
pages _____, filed with the letter of _____

☐ the drawings:

pages _____, as originally filed
pages _____, filed with the demand
pages _____, filed with the letter of _____

☐ the sequence listing part of the description:

pages _____, as originally filed
pages _____, filed with the demand
pages _____, filed with the letter of _____

2. With regard to the **language**, all the elements marked above were available or furnished to this Authority in the language in which the international application was filed, unless otherwise indicated under this item.
These elements were available or furnished to this Authority in the following language _____ which is:

☐ the language of a translation furnished for the purposes of international search (under Rule 23.1(b)).

☐ the language of publication of the international application (under Rule 48.3(b)).

☐ the language of the translation furnished for the purposes of international preliminary examination (under Rule 55.2 and/or 55.3).

3. With regard to any **nucleotide and/or amino acid sequence** disclosed in the international application, the international preliminary examination was carried out on the basis of the sequence listing:

☐ contained in the international application in written form.

☐ filed together with the international application in computer readable form.

☐ furnished subsequently to this Authority in written form.

☐ furnished subsequently to this Authority in computer readable form.

☐ The statement that the subsequently furnished written sequence listing does not go beyond the disclosure in the international application as filed has been furnished.

☐ The statement that the information recorded in computer readable form is identical to the written sequence listing has been furnished.

4. ☐ The amendments have resulted in the cancellation of:

☐ the description, pages _____

☐ the claims, Nos. _____

☐ the drawings, sheets/fig _____

5. ☐ This report has been established as if (some of) the amendments had not been made, since they have been considered to go beyond the disclosure as filed, as indicated in the Supplemental Box (Rule 70.2(c)).**

* *Replacement sheets which have been furnished to the receiving Office in response to an invitation under Article 14 are referred to in this report as "originally filed" and are not annexed to this report since they do not contain amendments (Rule 70.16 and 70.17).*

** *Any replacement sheet containing such amendments must be referred to under item 1 and annexed to this report.*

V. **Reasoned statement under Article 35(2) with regard to novelty, inventive step or industrial applicability; citations and explanations supporting such statement**

1. Statement

Novelty (N)	Claims	1-12	YES
	Claims		NO
Inventive step (IS)	Claims	1-12	YES
	Claims		NO
Industrial applicability (IA)	Claims	1-12	YES
	Claims		NO

2. Citations and explanations

1. Reference is made to the following documents:

D1: DE 198 55 666 A (STUDIENGESELLSHAFT KOHLE MBH)
8 June 2000 (2000-06-08)

D2: DE 21 22 610 A (SIEMENS AKTIENGESELLSCHAFT)
23 November 1972 (1972-11-23)

2. Novelty

Document D2 (page 7, line 5 to page 8, middle) is considered the prior art closest to the subject matter of claim 1. It discloses a method for the electrolytic coating of materials with aluminum, the workpiece first being electropolished and then electroplated. Anodic pre-treatment and electroplating can be carried out in the same electrolyte if the workpiece to be treated consists of beryllium or aluminum but not if it consists of magnesium, zinc or titanium. The electrolyte used for this purpose is oxygen-free, moisture-free, aprotic and contains aluminum alkyl (D2, page 8, paragraph 3).

The method according to claim 1 thus differs from the subject matter known from D2 firstly in that the electrolyte contains the combination of solvents $Al(R^4)_3$ and $Na[(R^1)_3Al-(H-Al(R^2)_2)_n-R^3]$, where n = 1 or 0, and

secondly in that not only beryllium and aluminum materials but also other materials, i.e. at least aluminum-magnesium alloy components and magnesium components (examples 1 and 2 of the present application) can be pretreated by electro-polishing in the coating bath.

Therefore, the subject matter of claim 1 is novel (PCT Article 33(2)).

3. Inventive Step

The problem to be solved by the present invention can thus be seen as that of providing a method wherein aluminum, magnesium or aluminum-magnesium layers can be applied to materials, the quality of the metallic coating being increased by an improved pretreatment of the material. In particular, the improved pretreatment is intended to prevent any new contamination or oxidation of the material.

The solution to this problem as proposed in claim 1 of the present application involves an inventive step (PCT Article 33(3).

According to document D2 (page 6, line 26 to page 8, line 6 and page 8, paragraph 3), a method is known that allows pre-anodization and subsequent cathodic deposition to be carried out in one single bath. In this way, contamination and oxidation of the material are prevented. This method can be carried out successfully on beryllium and aluminum materials in oxygen-free, moisture-free, aprotic and aluminum alkyl-containing electrolytes. However, for other materials, such as titanium, magnesium or zinc, the pretreatment step and the coating step must be carried out in separate baths. This results not only in more labor and

higher costs but also in contamination of the electrolyte or oxidation of the materials.

The contribution made by the method disclosed in claim 1 is that of improving an only conditionally applicable method for carrying out pretreatment and deposition in one single electrolyte so that said method can be applied to a broader group of materials. This was achieved by using an electrolyte that is modified with respect to document D2. Said modified electrolyte corresponds to the electrolyte disclosed in document D1 (page 2, line 65 to page 3, line 11; page 3, lines 19-21 and 43-49) for the deposition of aluminum or aluminum alloys, wherein the electrolyte contains $Na[Et_3Al-H-AlEt_3]$ or $K[AlEt_4]$, has additional $Al(R_3)$ and contains toluene or xylol as a solvent. The combination of the teaching of documents D2 and D1 does not seem obvious in any way but is in fact surprising, since it cannot be deduced from any of the documents that - when the electrolytes according to D1 are used - it is possible to expand the group of materials that can be treated in a single bath.

Claims 2-12 are dependent upon claim 1 and thus likewise satisfy the PCT requirements with respect to novelty and inventive step.

4. Industrial Applicability

The subject matter of claims 1-12 can applied industrially in the field of electrochemical plating, and therefore the present application can be considered to have fulfilled the criteria of PCT Article 33(4).